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ABSTRACT

This is a discussion of some of the problems that the Advisory Organization for Gulf Industries (AOGI) will face when it undertakes (1) to organize both an information center (node) that will serve the information needs of the Gulf States of Iraq, Kuwait, Bahrain, Saudi Arabia, Qatar, the United Arab Emirates (UAE) and Oman; and (2) to compile an indigenous data bank that can supply the nations of the world with comprehensive economic information and statistics about the seven member states. Emphasis is placed on the collection and indexing of data. (Author/JEG)

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COORDINATED ECONOMIC DEVELOPMENT AND THE INFORMATION NETWORK

by

D.K. Easton

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Coordinated Economic Development and the Information Network

by D.K. EASTON

Introduction

This is not an attempt at project appraisal. Although the importance of a region's objectives for the choice of projects is readily recognized, it is obvious that project appraisal in terms of cost effectiveness is difficult to weigh in the balance with the need for something that may assume national and critical interregional strategic importance. Science and research are of such a nature. The developing countries must have their share of research not just to augment their gross national product, but to add to their intellectual infrastructure which is important to their self-esteem and to their claim to a share of the world's scientific progress.

In the beginning a developing region is likely to be largely dependent on information from the outside world for much of its technology. The word "technology" implies an immense field of different types of applications which must be sorted and evaluated to find those that can be transferred from one society to another without adverse side effects. The task of sorting and evaluating can only be performed after the knowledge involved has been gathered. This gathering or accumulation of knowledge or information, therefore, is a primary objective in a developing economy, and the fact that it is only a beginning in a complicated process of assimilating technology should not in the least minimize its importance. The fact that it can be done on such a comprehensive scale in the age of information explosion is a tribute to the rapid progress that has evolved from the days of the invention of the calculating machine to the concept of the modern digital computer. It would be impossible to tape the great store of data that is needed in modern problem solving and technical adaptations without access to automated data banks and retrieval systems which are

the offspring of computer technology aided by such modern implements as magnetic tape, teletypewriters, the Cathode Ray, etc.

A Two-Way Project for the Arabian Gulf Area

This is a discussion of some of the problems that the Advisory Organization for Gulf Industries (AOGI) will face when it undertakes (1) to organize both an information center (node) that will serve the information needs of the Gulf States of Iraq, Kuwait, Bahrain, Saudi Arabia, Qatar, the United Arab Emirates (UAE) and Oman; and (2) to compile an indigenous data bank that can supply the nations of the world with comprehensive economic information and statistics about these seven member states. This will be an effort in information resources sharing that is very desirable, but not always practical for the poorer developing countries because of the expense involved. The Gulf States, with their wealth based on oil reserves, should be able to work in unison through the AOGI to build a reciprocal information network that will be both internally useful and functional and at the same time enable them to furnish the outside world with an Arabian Gulf information resource that will be of very considerable usefulness to the economic experts and business men whose need to know and ability to analyse depends upon reliable world information sources.

Although the wealth of the Gulf States is such that the capital investment required by an information network will not be in any sense prohibitive, one must take into consideration the special characteristics of international organizations. The AOGI includes seven countries whose delegates will represent varying degrees of awareness to the many different problems that beset an organization of this type. The information network will be competing with other projects which have their enthusiastic advocates, and therefore the "raison d'etre" for the information network must be logically and factually established. This is especially necessary because the initial capital investment will be considerable,

and the results or profit from this investment may be slow in materializing. The nodal function of the proposed network is by far the less complicated. It involves initially comparatively little capital to set up the terminal equipment that can transmit on-line literature and data profiles for searching, communicating interactively with the data bases and receiving via teletypewriter or CRT equipment the responses required. What is most important is to know the whereabouts of the data bases that store the different types (bibliographic or numerical-statistical) of data in the different subject categories that will be required by Gulf Area customers. At this point, it is assumed that the information needed will be primarily economic and that it will be principally used by government officials, business men and engineers.

Except for the initial expense of equipment and the continuing overhead of the staff and employees, the costs of the information node which connects with all useful data bases are direct- that is, they can be charged to the customer for his individual searches and consist essentially of the cost of the overseas telephone connection and computer time that are directly charged to each search. In the cases of data bases that require annual subscriptions and charge an annual rate for this, the costs will have to be pro-rated.

The expense of the original equipment, as all of us know who work with computers and other expensive machines, depends on whether the equipment and instrumentation are purchased outright, or are leased. As leasing has the well known advantage of allowing an organization to move easily into the new generation of more proficient models when these appear on the market, leasing is usually the more practical as well as requiring a smaller original capital investment.

The staff cannot be separated by the two categories of functions that we have established for our information system. Even if the

implementation of the indigenous data bank should be delayed in favor of giving immediate priority to the function of the information center objective which can produce demonstrable results much more quickly, staffing is going to be expensive. The operation of the actual searching by computer may be fairly routine, but the work that goes into the profiling of individual searches requires subject as well as information experts. As a new operation cannot afford many skilled operating personnel in the beginning, it is a safe assumption that those who are recruited will have to be exceptionally versatile in their knowledge of economic concepts and commercial terminology, and well acquainted with the special features of the many data bases and the language systems used to interrogate them.

Of course, the staffs that will organize, administer and operate the two systems will be identical and interchangeable. The indigenous data bank, however, will be by far the more talent-consuming and time-consuming operation of the two. It is a very complex operation, as I hope the following remarks will emphasize. To begin with, the data or imput into the Bank must be collected from a large number of sources in the seven member states. It must have a reliability that is very difficult to achieve unless the sources themselves are properly disciplined to distribute only data that meets strict standards. The AOGI Secretariat will have to organize formal educational efforts to train their information sources in the Gulf area to generate and compile data of the required accuracy and consistency. In other words, all units of information must be exact measurements of the same qualities and quantities.

The data received from its sources must also be carefully screened by the Staff of the Secretariat before imput can be allowed into the Data Bank. Only after it has been carefully examined can the data be classified, analysed, described, indexed and specified for differing categories of computer imput. If resource

sharing in data exchange is to prove itself trustworthy, the end product must pass all tests of critical analysis. For it is regretably evident that data bases are becoming more prone to increase their capacity at the expense of quality. Those who suffer from being furnished information that lacks authenticity are being disilusioned. If this trend continues so that various systems contain a mix that varies considerably in quality, an unhealthy degree of skepticism will develop that bodes ill for the future of computerized information retrieval. That is why the necessity of careful preparation of information at its source is stressed here, ard further stress is placed on refinement by a trained staff so that the results meet very high standards.

The indexing operation is, of course, largely dependent for its efficiency upon a semantic base that is concise, systematic and well cross-referenced. A thesaurus is just such a base. It is an organized effort to bring order and structure to information through the use of word descriptors. The alternative to the thesaurus, or structured vocabulary, is natural language, which in the opinion of many experts in the field puts too large a burden on the software program, and hence on the computer's function in the program. Therefore, it is being assumed here that a thesaurus will be compiled which will control the indexing of the data within a rational framework. The efficiency of retrieval, or the ratio of direct hits to rejects in the output, is heavily dependent on the quality of the thesaurus as well as on the skill with which it is used.

The fact that compiling a thesaurus is a time-consuming and arduous task is one of the reasons for my assumption in an earlier paragraph that the return on the investment in an indigenous data bank would be slow in materializing. The thesaurus is compiled progressively as information is indexed into the Bank, and the imput must reach a certain volume while the thesaurus expands before the capacity of the Bank is sufficient to provide in-depth searchs, and broad enough in scope to serve a wide range of users. The

thesaurus will be constructed of economic, legal, financial, social, managerial and operational vocabulary. It will be a heterogeneous mixture that will require that word relationships be brought sharply into focus so that indexing for imput and profiling for literature and data searches can be carried out effectively. Here again emphasis is being placed on the need for adequate preparation so that the Gulf area data bank can achieve its objectives of being a reliable font of knowledge that can be accessed effectively.

Doubts concerning the scope of large computer operated information systems are diminishing, but one serious consideration is repeatedly stressed by authors writing on the subject. Computers on their own cannot handle the logical processes of evaluating and organizing literature. The design of systems requires a very high level of engineering talent. Evaluation of literature or data is an intellectual exercise that must be performed by trained experts. It is based on a deep analysis of content which has to be translated into cogent terminology at the outset. This means that the highly trained staff will be the most important component of the organization, and the most expensive.

This staff breaks down essentially into two components: (1) the data processing staff and (2) the technical information staff. The former (1) would consist of a Data Base Administrator responsible for the validity of the information being supplied from certified sources, the kinds of information going into the system and the organization of these different categories for storage (imput) and for retrieval (output); and a Programmer who designs the operations that enter information into the system, read it, update it and program it for retrieval. The latter (2) would consist of a Supervisory Technical Information Specialist whose initial responsibility would be to compile an authoritative thesaurus of subject descriptors that would cover the vocabulary requirements of the wide range of activities represented by the AOGI data base. The

thesaurus would be an ongoing project, for it would have to expand with the subject potential of the system. In the beginning, the Supervisor will work with one Technical Information Specialist whose resposibility will be to structure literature and data searches for computer retrieval, and to provide current awareness updates from the new information channeling into the system.

Prologue

Emphasis has been placed in this presentation on the collection and indexing of data, or on what is generally described as a conventional documentation service. The primary aspirations of the developing countries for industrialization and increased productivity in general cannot, however, depend simply upon a supply of information. This is a very valuable beginning that needs to be expanded at later stages of development into the wider context of assessment, analysis, synthesis, and repackaging of information for customer service, as well as to specific recommendations applicable to technology transfer.

The Information Center staff will be expected to provide to governments, industries and business at all levels expert advice on the use of modern business applications, systems analysis in the decision-making process, technological choice in respect to products for domestic consumption and for export; product reliability and standards; plant size, architecture and organization; production capacity, machinery, equipment and instrumentation; licensing agreements and patents, etc.

Thus the ideal information organization develops into a system where the subject and information expert will have a positive and progressive influence on the decision-making process and value judgments of leaders in the Arabian Gulf community. This, of course, will all take brains, energy and time. Each additional advance forward will depend upon the success of previous steps.